Radiotherapy and Oncology 150 (2020) 40–42

Contents lists available at ScienceDirect

Radiotherapy and Oncology

journal homepage: www.thegreenjournal.com

COVID-19 Rapid Letter

Effect of COVID-19 pandemic on practice in European radiation oncology centers ☆

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ARTICLE INFO

Article history:
Received 26 May 2020
Received in revised form 6 June 2020
Accepted 6 June 2020
Available online 13 June 2020

Keywords:
Radiotherapy
Departments
Covid19
Organization

ABSTRACT

ESTRO surveyed European radiation oncology department heads to evaluate the impact of COVID-19. Telemedicine was used in 78% of the departments, and 60% reported a decline in patient volume. Use of protective measures was implemented on a large scale, but shortages of personal protective equipment were present in more than half of the departments.

The recent outbreak of the novel coronavirus SARS-CoV-2, leading to COrona VIrus Disease 19 (COVID-19), has a large impact on the provision and organization of cancer care [1,2]. Cancer patients represent one of the most fragile groups due to their sometimes compromised clinical conditions and ongoing treatments. For patients undergoing or planned for radiation therapy, radiation oncology (RO) departments adjusted management protocols to maintain their ability to deliver optimal care to all of their patients. In the past three months, numerous articles, case-reports and editorials were published to address these issues in general or for specific disease sites or treatment modalities [3–6].

The American Society for Radiation Oncology (ASTRO) surveyed over 500 physician leaders of US departments to understand the impact of the pandemic and the changes that have been implemented to cope with them [7]. The ASTRO leadership offered the European SocieTy for Radiotherapy and Oncology (ESTRO) to use this questionnaire as a basis for a European survey. The questionnaire, slightly modified to be used by ESTRO, was sent on May 6, to 474 ESTRO members who were registered as head of a radiation oncology (RO) department in Europe plus 26 representatives of other departments with no registered head. After 14 days a total of 139 (nearly) completed questionnaires were received (response rate 28%) from 29 different countries. Most responses were from Italy (20; 14%), Germany (17; 12%), Spain (15; 11%), the Netherlands (10; 7%), Switzerland (9; 6%), the United Kingdom (8; 6%) and Belgium (7; 5%). The remaining 53 represented less than 5% of all responses and were from the 22 other countries.

Responding departments treat a median of 1300 new cancer cases annually (range: 100–6500); with staffing levels being at a median of 9 FTE radiation oncologists (range: 1–43) and 18 FTE radiation technologists (range: 4–144). During the pandemic, the median number of patients under treatment was 100 per day (range 6–440).

All departments were operational. In 58% of them, treatment of some new patients was deferred to a later date. As shown in Table 1, this varied from 40% in Italy and the Netherlands to 100% of the responding centers in the United Kingdom.

In 78% of the departments (109), telemedicine was used, being specifically introduced now in 83 of them (76%). Telemedicine was used for clinical assessment of patients under treatment in 22% of the departments and for surveillance visits during follow-up in

☆ The Editors of the Journal, the Publisher and the European Society for Radiotherapy and Oncology (ESTRO) cannot take responsibility for the statements or opinions expressed by the authors of these articles. Practitioners and researchers must always rely on their own experience and knowledge in evaluating and using any information, methods, compounds or experiments described herein. Because of rapid advances in the medical sciences, in particular, independent verification of diagnoses and drug dosages should be made. For more information see the editorial "Radiotherapy & Oncology during the COVID-19 pandemic", Vol. 146, 2020.

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https://doi.org/10.1016/j.radonc.2020.06.007
0167-8140/

Table 1
Use of telemedicine for patients under treatment and for follow-up, deferral/delay of some patient groups, observed decline in number of patients, and causes for shortage of staff.

Country	Telemedicine				Deferring		Decline in		Staff shortage							
	Under treatment		Follow-up		patients		number of patients		Covid disease		Family care		Fewer patients		Staff transfer	
Italy	1/20	5%	14/20	70%	8/20	40%	12/20	60%	8/20	40%	7/20	35%	1/20	5%	4/20	20%
Germany	2/17	12%	7/17	41%	13/17	76%	9/17	53%	1/17	6%	3/17	18%	1/17	6%	1/17	6%
Spain	4/15	27%	13/15	87%	11/15	73%	8/15	53%	10/14	71%	4/14	29%	2/14	14%	4/14	29%
Netherlands	6/10	60%	10/10	100%	4/10	40%	5/10	50%	0/9	0%	2/9	22%	1/9	11%	2/9	22%
Switzerland	4/9	44%	7/9	78%	8/9	89%	5/9	56%	1/9	11%	2/9	22%	0/9	0%	1/9	11%
United Kingdom	7/8	88%	6/8	75%	8/8	100%	7/8	88%	5/7	71%	5/7	71%	0/7	0%	2/7	29%
Belgium	0/7	0%	7/7	100%	3/7	43%	6/7	86%	2/6	33%	0/6	0%	2/6	33%	0/6	0%
Other	7/53	13%	36/53	68%	26/53	49%	32/53	60%	8/52	15%	16/52	31%	8/52	15%	4/52	8%
All	31/139	22%	100/139	72%	81/139	58%	84/139	60%	35/134	26%	39/134	29%	15/134	11%	18/134	13%

72%. There were important differences between countries, with the highest use of telemedicine in the United Kingdom and the Netherlands (Table 1).

A decline in patient volume was noticed in 60% of the departments. This was due to delays/deferrals for certain disease sites in 65%, reduced referrals in 75% and shortage of staff in 15%. The reduction in patient volume was on average 25% (median 20%), with an ensuing estimated decrease of >20% in revenue reported by 25% of the departments. As shown in Table 1, the decline was more often reported in centers from Belgium and the United Kingdom.

A reduction in staff occurred in 57% of the departments, mainly due to the impact of the COVID-19 pandemic on family care responsibilities (29%), staff COVID-19 illness (26%) and staff transfer to other clinical areas (13%). In 11%, staffing was reduced due to the smaller number of patients visiting the department. In the Netherlands, Germany and Switzerland, COVID-19 infection of staff was infrequent, whereas it was reported in around 70% in Spain and the United Kingdom (Table 1).

All centers were asked whether they were delaying treatment for specific indications. The most common indications were:

- Prostate cancer (low risk 62%; intermediate risk 40%, high risk 20%).
- Non-malignant indications (38%).
- Early stage breast cancer (31%).
- Palliative nonemergent indications (25%).
- Non-melanoma skin tumors (16%).
- Low grade gliomas (16%).
- SBRT for oligometastatic disease (10%).

Protection measures in use for the staff included:

- Routine use of masks (89%).
- Social distancing (88%).
- Use of gloves (69%), face shields (52%) and/or gowns (46%) for treatments and procedures.
- Screening prior to each shift (60%).
- Staggered shift scheduling (58%).

Screening of all patients at the entrance was performed in 82%, and 88% of the departments didn't allow visitors. Increased cleaning/disinfecting of immobilization devices was done in 95% and increased cleaning/disinfecting of treatment tables in 85%. Shortages of personal protective equipment were reported by 48% of the departments, of medical hand sanitizer by 20% and of nasopharyngeal swabs for SARS-CoV-2 specimen collection in 16%. As shown in Table 2, there were important differences between countries for the various items. Shortages of drugs were reported by 6%. Forty-five percent reported no shortages for any of the items.

The vast majority of departments (95%) used national guidelines (85%) or information from ESTRO (62%) and ASTRO (29%) websites for guidance during the COVID-19 pandemic (Table 2). It should be noted that in some countries (e.g. Belgium) the national guideline referred to ESTRO (and ASTRO) websites.

A comparison of the European data with data from North-America [1], shows many similarities. However, in the ASTRO report, 84% of centers reported a decrease in patient volumes to 80% or less compared to normal, whereas this was the case in only 38% of the European centers. Similarly, a larger effect on practice revenue was foreseen by American centers. Another important difference was the related to the availability of one or more key supplies. There was a shortage in 78% of the US centers, while this was the case in only 52% of the centers in Europe, but with large variation between countries. For reference, an overview of the COVID-19 situation in the top-7 responding countries is given in Table 3 [11].

The COVID-19 pandemic has created an unprecedented challenge for health care systems worldwide. Radiation therapy is a life-saving treatment and should be guaranteed to all patients with cancer for whom it is indicated. Limitations in resources, including space, equipment, and staff, may result in reduction of treatment capacity. Furthermore, exposure of high-risk patients to SARS-CoV-2 should be minimized by limiting the number of visits for RT.

The ESTRO survey gathered responses from a large number of RO centres (139) in a very short time period and displays an international overview of RT management during the COVID-19 pandemic.

This survey shows that, irrespective of national differences that may partly be explained by the number of respondents and the varying epidemiological impact of the pandemic in different European countries, the radiation oncology community immediately organised itself with joint efforts to ensure continuity of therapies while protecting patients, healthcare professionals, and the general population.

Old principles were quickly adopted as new behaviors to European radiation oncologists:

SARS: Safety, Avoidance, Rescheduling, Shortening.

S: **Safety**, meaning use of PPE for healthcare professionals and patients, triage for screening of patients, no visitors in RO departments, telemedicine for follow-up visits and clinical multidisciplinary evaluations;

A: **Avoidance**, meaning omission of radiation therapy when the risk of severe complication from COVID-19 (for elderly patients and/or with serious underlying health conditions) outweighs the benefit of radiation therapy;

R: **Rescheduling**, meaning deferring/delaying of RT when there is no or little expected adverse effect on outcome from the delay;

S: **Shortening**, meaning more extensive use of hypofractionated schedules with the aim of maintaining high tumor control probability rates without undue toxicity.

Table 2
Shortage of personal protective equipment (PPE), medical hand sanitizer and nasopharyngeal swabs for COVID19 tests and use of ESTRO and ASTRO websites and/or national guidelines.

Country	Shortage of						ESTRO		ASTRO		National	
	PPE		Hand sanitizer		Covid-swabs		website		website		guidelines	
Italy	8/19	42%	3/19	16%	4/19	21%	14/20	70%	5/20	25%	17/20	85%
Germany	13/17	76%	11/17	65%	1/17	6%	9/17	53%	4/17	24%	17/17	100%
Spain	7/15	47%	1/15	7%	0/15	0%	8/14	57%	4/14	29%	13/14	93%
Netherlands	4/9	44%	3/9	33%	2/9	22%	6/9	67%	3/9	33%	9/9	100%
Switzerland	2/9	22%	1/9	11%	1/9	11%	7/9	78%	5/9	56%	8/9	89%
United Kingdom	4/7	57%	2/7	29%	1/7	14%	1/7	14%	0/7	0%	6/7	86%
Belgium	4/6	67%	0/6	0%	4/6	67%	2/6	33%	1/6	17%	4/6	67%
Other	22/52	42%	6/52	12%	8/52	15%	36/51	71%	16/51	31%	38/51	75%
All	64/134	48%	27/134	20%	21/134	16%	83/133	62%	38/133	29%	112/133	84%

Table 3
Daily new and total COVID-19 cases and deaths in seven responding countries on May 21, 2020 [11].

	Cases			Deaths	
Country	Population (M)	Daily new	Total	Daily new	Total
Italy	60,5	642	228,006	156	32,486
Germany	83,7	490	179,021	39	8309
Spain	46,8	539	280,117	52	27,904
Netherlands	17,1	253	44,700	27	5775
Switzerland	8,7	36	30,694	6	1898
United Kingdom	67,9	2615	252,947	338	36,042
Belgium	11,6	252	56,235	36	9186

We should acknowledge the potential bias and selection of the centers who responded to the survey, with the number of responses per country not being clearly related to the number of centers in the various countries. Additionally, the survey was a snapshot at a certain date relatively late during the COVID-19 pandemic where many issues, which were present initially, had already been resolved and written in guidelines [8,9].

As the survey did not include questions on fractionation choices/modifications during this time of crisis, it is not able to evaluate potential differences on shortening of treatment that may certainly have been present at European level [10]. It did, however, clearly document variations amongst European countries regarding aspects linked to safety, avoidance and rescheduling.

Conflict of interest statement

The authors report no conflict of interest.

Acknowledgement

The authors would like to thank all who participated in this survey and the support of the ESTRO office in conducting the survey.

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